

Numerical Analysis of the Correctness of Assumptions and Models of Adsorption Process in Various Methods of the Microporous Structure Description

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Continuous development of science and constantly growing areas of applications of carbon adsorbents, such as activated carbon, make it necessary to constantly improve not only the methods of their preparation, but also comprehensive basic research, the aim of which is to determine and explain the mechanisms and physicochemical phenomena occurring at the various stages of obtaining these materials. It is also necessary to develop appropriate relationships between these complex phenomena and processes, enabling the prediction of these mechanisms and the adsorption properties of activated carbons obtained by means of given methods and under specific conditions of practical chemistry from given raw materials. Very important for the development of basic research in the field of adsorption and physicochemistry of surface phenomena have analysis of the correctness of assumptions and models of adsorption process in various methods from the simplest to advanced based on the density functional theory or numerical tools based on complex mathematical models. The part of the work devoted to the methods of porous structure analysis will provide a lot of information on the reliability of the obtained results and the possibility of interpreting on their basis the mechanisms of physicochemical phenomena on the surface, which will significantly increase the quality and reliability of the conducted research in this area, giving guidelines and proven procedures for the interpretation of experimental research.

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Biography:

Dr. Mirosław Kwiatkowski in 2004 obtained Ph.D. degree at the AGH University of Science and Technology in Kraków (Poland) and in 2018 D.Sc. degree at the Wrocław University of Technology (Poland) in the discipline: chemical technology. His published work includes more than 45 papers in reputable international journals and 90 conference proceedings. He is the editor in chief of "The International Journal of System Modeling and Simulation" (United Arab Emirates) and associate editor of Micro & Nano Letters Journal (United Kingdom) and a member of the editorial board of international journals as well as a member of the organizing and scientific committees many international conferences in Europe, Asia and United States of America. Dr. hab. eng. Mirosław Kwiatkowski is also a regular reviewer in a most reputable scientific journals.